

What is claimed is:

1. A failure recovery method in a dual optical ring network including an inner ring and an outer ring, a plurality of nodes, a first concentrator and a second concentrator, wherein each node includes at least an interface A and an interface B each comprising an input 5 interface and an output interface, said method comprising the steps of:  
connecting interface A of every even node and interface B of every odd node to said first concentrator and connecting interface B of every even node and interface A of every odd node to said second concentrator;  
configuring said first concentrator and said second concentrator so as to connect said 10 plurality of nodes to form bi-directional dual counter-rotating optical rings;  
in the event of a failure of a concentrator, configuring interfaces in said plurality of nodes connected to the failed concentrator to loopback configuration; and  
configuring said surviving concentrator such that the interfaces of said plurality of nodes are connected in daisy chain fashion so as to form a single optical ring.

15 2. The method according to claim 1, said plurality of nodes comprises a plurality of routers.

3. The method according to claim 1, said plurality of nodes comprises a plurality of routers adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) protocol.

20 4. The method according to claim 1, said first concentrator and said second concentrator are adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) protocol.

5. The method according to claim 1, said plurality of nodes are adapted to detect a failure of either said first concentrator or said second concentrator.

25 6. The method according to claim 1, further comprising the step of detecting the failure of either said first concentrator or said second concentrator, and in response thereto sending Spatial Reuse Protocol (SRP) Long Intelligent Protection Switching (IPS) protocol compatible packets advertising said failure.

7. The method according to claim 1, wherein in the event the number of nodes is even, an equal number of A interfaces and B interfaces are connected to said first concentrator and said second concentrator.

8. The method according to claim 1, wherein in the event the number of nodes is odd, 5 connecting an optical fiber to said first concentrator and second concentrator and configuring said first concentrator and second concentrator so as to close the inner ring and outer ring.

9. A method of connecting a plurality of nodes to a first concentrator and a second concentrator to form a dual optical ring network including an inner ring and an outer ring, each node including an interface A and an interface B, said method comprising the steps of:

10 beginning with a first node, configuring said first concentrator and said second concentrator so as to connect interface B of a particular node to interface A of its neighboring node;

configuring said first concentrator and said second concentrator so as to connect interface B of the last node with interface A of said first node; and

15 in the event the number of nodes is odd, connecting a pair of optical fibers between said first concentrator and said second concentrator in lieu of a node after the last node.

10. The method according to claim 9, said plurality of nodes comprises a plurality of routers.

20 11. The method according to claim 9, said plurality of nodes comprises a plurality of routers adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) protocol.

12. The method according to claim 9, said first concentrator and said second concentrator adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) 25 protocol.

13. A recovery method for use in a dual optical ring network including an inner ring and an outer ring, a plurality of nodes, a first concentrator and a second concentrator, wherein each node includes at least an interface A and an interface B each comprising an input and an output, said method comprising the steps of:

beginning with a first node, configuring said first concentrator and said second concentrator so as to connect interface B of a particular node to interface A of its neighboring node;

5               configuring said first concentrator and said second concentrator so as to connect interface B of the last node with interface A of said first node;

in the event of a failure of a concentrator, configuring interfaces connected to the failed concentrator to loopback operation; and

10              on said inner ring, connecting interface A output to interface B input on a neighboring node and connecting interface A output of the last node to interface B input of the first node to close the ring.

14.         The method according to claim 13, said plurality of nodes comprises a plurality of routers.

15.         The method according to claim 13, said plurality of nodes comprises a plurality of routers adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) protocol.

16.         The method according to claim 13, said first concentrator and said second concentrator adapted to run Spatial Reuse Protocol (SRP) and Intelligent Protection Switching (IPS) protocol.

17.         The method according to claim 13, said plurality of nodes are adapted to detect a failure of either said first concentrator or said second concentrator.

18.         The method according to claim 13, further comprising the step of detecting the failure of either said first concentrator or said second concentrator, and in response thereto sending Spatial Reuse Protocol (SRP) Long Intelligent Protection Switching (IPS) protocol compatible packets advertising said failure.

25 19.         The method according to claim 13, wherein in the event the number of nodes is even, an equal number of A interfaces and B interfaces are connected to said first concentrator and said second concentrator.

20. The method according to claim 13, wherein in the event the number of nodes is odd, connecting an optical fiber to said first concentrator and second concentrator and configuring said first concentrator and second concentrator so as to close the inner ring and outer ring.

21. A recovery method for use in a dual optical ring network including an inner ring and  
5 an outer ring, an odd number of nodes, a first concentrator and a second concentrator, wherein each node includes at least an interface A and an interface B each comprising an input and an output, said method comprising the steps of:

beginning with a first node, configuring said first concentrator and said second concentrator so as to connect interface B of a particular node to interface A of its neighboring node;

configuring said first concentrator and said second concentrator so as to connect interface B of the last node with interface A of said first node;

connecting a pair of optical fibers between said first concentrator and said second concentrator in lieu of a node after the last node;

in the event of a failure of a concentrator, configuring interfaces connected to the failed concentrator to loopback operation;

on said inner ring, connecting interface A output to interface B input on a neighboring node and connecting interface A output of the last node to interface B input of the first node; and

20 connecting the output interface of the last node to the input interface of the first node to close the ring.

22. A computer program product stored on a computer readable medium containing instructions which when executed by a device cause the device to perform the steps of:

configuring, beginning with a first node, a concentrator so as to connect interface B of  
25 a particular node to interface A of its neighboring node;

configuring said concentrator so as to connect interface B of the last node with interface A of said first node;

in the event of a failure of said concentrator, configuring interfaces connected to said failed concentrator to operate in loopback operation; and

30 connecting, on said inner ring, interface A output to interface B input on a neighboring node and connecting interface A output of the last node to interface B input of the first node.

23. A concentrator for use in a dual optical ring network including an inner ring and an outer ring, a plurality of nodes, wherein each node includes at least an interface A and an interface B each comprising an input interface and an output interface, comprising:

means for connecting interface A of every even node and interface B of every odd  
5 node to said concentrator;

means for configuring said concentrator so as to connect said plurality of nodes to  
form bi-directional dual counter-rotating optical rings;

means for configuring interfaces in said plurality of nodes to loopback operation in  
the event of a failure of said concentrator; and

10 means for configuring said concentrator such that the interfaces of said plurality of  
nodes are connected in daisy chain fashion so as to form a single optical ring.